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EXAMINER	
ALUNKAL, THOMAS D	

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2627	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/751,731	LEE ET AL.	
	Examiner	Art Unit	
	THOMAS D. ALUNKAL	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-10,13,15-17,19-21,23-31 and 33-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-10,13,15-17,19-21,23-31 and 33-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Arguments

Applicant's arguments with respect to claims 1, 3-10, 13, 15-17, 19-21, 23-31, and 33-38 have been considered but are moot in view of the new ground(s) of rejection.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 17, 19-21, 23-25, 27-29, 31, 37, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over et al (hereafter Yokoi) (US 5,732,062).

Regarding claim 17, Yokoi discloses a method of recording data onto an optical recording medium (Column 11, lines 58-62 and Column 8, lines 38-40), the method comprising: generating a recording waveform having a recording pattern for high-speed recording (Column 4, lines 53-58 and Figure 7) and forming a first level of the data as a mark and a second level of the data as a space, using the generated recording waveform (Column 11, lines 65-67 and Figure 17, which displays the mark and subsequent unmarked space), wherein the recording pattern is formed of recording multi-pulse trains including a first pulse, a multi-pulse train and/or last pulse (Figure 7, specifically, the multi-pulse light-emission waveform), wherein the multi-pulse train comprises a high write power level and a lower write power level (Figure 7, Elements Af

and Ar), the first pulse comprises the high write power level and the low write power level of the multi-pulse train (Figure 7, Elements Af and Ar), the last pulse comprises the high write power level of the multi-pulse train followed by a bias power level (Figure 7, Elements Br and C (which corresponds to the bias power level)), and the low write power level of the multi-pulse train is set to be higher than the bias power level of the last pulse (Figure 7, Elements Af and C where Af is set to higher than C). Yokoi does not disclose where the low write power level follows the high write power level in the first pulse in the embodiment disclosed in Figure 17. However, in a separate embodiment, Yokoi discloses a multi-pulse train where the first pulse includes a high write power level which is followed by a low write power level (Figure 27, Elements Af and Ar of the first pulse of the 6T mark).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to provide the first pulse arrangement of Figure 27 (i.e., providing the high write power level followed by the low write power) to the recording method of Yokoi, Figure 17, motivation being to produce sharp mark edges while reducing the effects of jitter.

Regarding claim 19, Yokoi discloses wherein a power for an erasure pattern for data erasure has a predetermined DC level (Figure 7, Pulse level D).

Regarding claim 20, Yokoi discloses wherein a ratio of a time duration of the last pulse to a time duration of the multi-pulse train has a predetermined range with respect to a range of jitter allowable by a system (Column 8, lines 41-52, wherein the heating pulse corresponds the multi-pulse heating pulse of Figure 7).

Regarding claim 21, Yokoi discloses a method of recording data onto an optical recording medium (Column 11, lines 58-62 and Column 8, lines 38-40), the method comprising: generating a recording waveform having a recording and an erasure pattern with a multi-pulse train for high-speed recording (Column 4, lines 53-58 and Figure 7. Specifically, level D which corresponds to erasure) and forming a first level of the data as a mark and a second level of the data as a space, using the generated recording waveform (Column 11, lines 65-67 and Figure 17, which displays the mark and subsequent unmarked space), wherein the recording pattern is formed of recording multi-pulse train including a first pulse, a multi-pulse train and/or last pulse (Figure 7, specifically, the multi-pulse light-emission waveform), wherein the multi-pulse train comprises a high write power level and a lower write power level (Figure 7, Elements Af and Ar), the first pulse comprises the high write power level and the low write power level of the multi-pulse train (Figure 7, Elements Af and Ar), the last pulse comprises the high write power level of the multi-pulse train followed by a bias power level (Figure 7, Elements Br and C (which corresponds to the bias power level)), and the low write power level of the multi-pulse train is set to be higher than the bias power level of the last pulse (Figure 7, Elements Af and C where Af is set to higher than C). Yokoi does not disclose where the low write power level follows the high write power level in the first pulse in the embodiment disclosed in Figure 17. However, in a separate embodiment, Yokoi discloses a multi-pulse train where the first pulse includes a high write power level which is followed by a low write power level (Figure 27, Elements Af and Ar of the first pulse of the 6T mark).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to provide the first pulse arrangement of Figure 27 (i.e., providing the high write power level followed by the low write power) to the recording method of Yokoi, Figure 17, motivation being to produce sharp mark edges while reducing the effects of jitter.

Regarding claim 23, Yokoi discloses wherein time periods of the recording multi-pulse train are controlled with respect to a timing window Tw within a range of .25-2.0Tw (Column 8, lines 41-52, which shows that time periods fall within the range).

Regarding claim 24, Yokoi discloses wherein time periods of the recording multi-pulse train are equal to 1.0Tw (Column 8, lines 17-22. Specifically, each heating and cooling pulse is equal to the period T).

Regarding claim 25, Yokoi discloses wherein time periods of the recording multi-pulse train are equal to 2.0Tw (Column 5, lines 56-61. Specifically, mark lengths can range from 1,2,3,4,ect...).

Regarding claim 27, Yokoi discloses wherein a ratio of a time duration of the last pulse to a time duration of the multi-pulse train has a predetermined range with respect to a range of jitter allowable by a system (Column 8, lines 41-52, wherein the heating pulse corresponds the multi-pulse heating pulse of Figure 7).

Regarding claim 28, Yokoi discloses wherein a minimum cooling time duration of the last pulse depends on the range of jitter allowable by a system, and a maximum cooling time duration of the last pulse depends on a length of a minimum recorded mark

(Column 7, lines 23-35. Specifically, the jitter is reduced with shorter cooling times, which is set to the shortest-length record mark size, to do so).

Regarding claim 29, Yokoi discloses wherein the cooling time duration of the last pulse of the recording pattern is set to the length of the minimum recorded mark (Column 8, lines 17-22).

Regarding claim 31, Yokoi discloses an apparatus for recording data onto an optical recording medium (Column 11, line 49), the apparatus comprising: a recording waveform generating circuit, which generates a recording waveform having a recording pattern for high-speed recording of the data (Column 11, lines 49-52 and Column 4, lines 53-58), and a pickup unit, which forms a mark or space by irradiating light onto the optical recording medium according to the generated recording waveform to record the data (Column 11, lines 60-63), wherein the recording pattern is formed of recording multi-pulse trains including a first pulse, a multi-pulse train and/or last pulse (Figure 7, specifically, the multi-pulse light-emission waveform), wherein the multi-pulse train comprises a high write power level and a lower write power level (Figure 7, Elements Af and Ar), the first pulse comprises the high write power level and the low write power level of the multi-pulse train (Figure 7, Elements Af and Ar), the last pulse comprises the high write power level of the multi-pulse train followed by bias power level (Figure 7, Elements Br and C (which corresponds to the bias power level)), and the low write power level of the multi-pulse train is set to be higher than the bias power level of the last pulse (Figure 7, Elements Af and C where Af is set to higher than C). Yokoi does not disclose where the low write power level follows the high write power level in the first

pulse in the embodiment disclosed in Figure 17. However, in a separate embodiment, Yokoi discloses a multi-pulse train where the first pulse includes a high write power level which is followed by a low write power level (Figure 27, Elements Af and Ar of the first pulse of the 6T mark).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to provide the first pulse arrangement of Figure 27 (i.e., providing the high write power level followed by the low write power) to the recording method of Yokoi, Figure 17, motivation being to produce sharp mark edges while reducing the effects of jitter.

Regarding claim 37, Yokoi discloses wherein a power for an erasure pattern for data erasure has a predetermined DC level (Figure 7, Pulse level D).

Regarding claim 38, Yokoi discloses wherein a ratio of a time duration of the last pulse to a time duration of the multi-pulse train has a predetermined range with respect to a range of jitter allowable by a system (Column 8, lines 41-52, wherein the heating pulse corresponds to the multi-pulse heating pulse of Figure 7).

Claims 1, 3-10,13,15-16, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoi et al (hereafter Yokoi) (US 5,732,062) and in view of Furukawa et al. (hereafter Furukawa) (US 6,343,062).

Regarding claim 1, Yokoi discloses an optical recording medium (Column 11, lines 58-62) recording, erasing, and reproducing data (Column 8, lines 38-40), comprising a recording layer including power information for high-speed recording of a

recording pattern for data recording is recorded (Figure 30A, Element 107a and Figure 7, specifically, the power of the various waveforms), wherein the power information indicates that a recording pattern is formed of a recording multi-pulse train including a first pulse, a multi-pulse train and/or last pulse (Figure 7, specifically, the multi-pulse light-emission waveform), wherein the multi-pulse train comprises a high write power level and a lower write power level (Figure 7, Elements Af and Ar), the first pulse comprises the high write power level and the low write power level of the multi-pulse train (Figure 7, Elements Af and Ar), the last pulse comprises the high write power level of the multi-pulse train followed by a bias power level (Figure 7, Elements Br and C (which corresponds to the bias power level)), and the low write power level of the multi-pulse train is set to be higher than the bias power level of the last pulse (Figure 7, Elements Af and C where Af is set to higher than C). Yokoi does not disclose where the low write power level follows the high write power level in the first pulse in the embodiment disclosed in Figure 17. However, in a separate embodiment, Yokoi discloses a multi-pulse train where the first pulse includes a high write power level which is followed by a low write power level (Figure 27, Elements Af and Ar of the first pulse of the 6T mark).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to provide the first pulse arrangement of Figure 27 (i.e., providing the high write power level followed by the low write power) to the recording method of Yokoi, Figure 17, motivation being to produce sharp mark edges while reducing the effects of jitter.

Furthermore, Yokoi does not disclose wherein the specific zone further contains additional recording information including power information. In the same field of endeavor, Furukawa discloses an optical disk for recording and reproducing high density signals which further has a control area, in which laser power information and beam modulation pattern information is stored (Figure 2, Element 61 and Column 13, lines 15-22).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to provide the control data area, containing power and modulation information, of Furukawa to the CD-ROM of Yokoi, motivation being to simplify the recording method of Yokoi wherein power control is read directly from the disc rather than an outside program or device, thereby increasing the access speed.

Regarding claim 3, Yokoi discloses wherein an erasure pattern formed of an erase multi-pulse train for data erasure is recorded (Column 12, lines 48-51), and the power information indicates that the erase multi-pulse train has a high erase power level and a low erase power level and the low erase power level is set to be equal to a general erase power, and the high erase power level is set to be equal to the predetermined DC level (Figure 7, Pulse level D).

Regarding claim 4, Yokoi discloses wherein a ratio of a time duration of the last pulse to a time duration of the multi-pulse train has a predetermined range with respect to a range of jitter allowable by a system (Column 8, lines 41-52, wherein the heating pulse corresponds the multi-pulse heating pulse of Figure 7).

Regarding claim 5, Yokoi discloses wherein the ratio of the time duration of the last pulse to the time duration of the multi-pulse train ranges from 0.9-1.3 (Column 8, lines 53-56. Specifically, the ratio of the cooling pulse to the heating pulse is 1.2). Yokoi also discloses wherein the range of jitter allowable by the system is 7% (This being an inherent property of the ratio of the time duration of the last pulse to the time duration of the multi-pulse).

Regarding claim 6, this claim recites limitations similar to those in claim 5 and is rejected over the same grounds.

Regarding claim 7, Yokoi discloses wherein a minimum cooling time duration of the last pulse depends on the range of jitter allowable by a system, and a maximum cooling time duration of the last pulse depends on a length of a minimum recorded mark (Column 7, lines 23-35. Specifically, the jitter is reduced with shorter cooling times, which is set to the shortest-length record mark size, to do so).

Regarding claim 8, Yokoi discloses wherein the cooling time duration of the last pulse of the recording pattern is set to the length of the minimum recorded mark (Column 8, lines 17-22).

Regarding claim 9,10,13, and 15, these claims contain limitations similar to those in claims 1,3,4,7, and 8 and are rejected over the same grounds.

Regarding claim 16, Yokoi discloses wherein power levels of a first pulse and a last pulse forming the erasure pattern are recorded as one of 4 types, including a first type where power levels of the first pulse and last pulse are equal to a high erase power level, a second type where the power level of the first pulse is equal to a low erase

power level and the power level of the last pulse is equal to the high erase power level, a third type where the power level of the first pulse is equal to the high erase power level and the power level of the last pulse is equal to the low erase power level, and a fourth type where the power levels of the first pulse and last pulse are equal to the low erase power level (Figure 7, light-emission power level D where first and last pulse are at the same erasure power).

Regarding claim 30, Yokoi discloses the limitations of base claim 21 above but does not disclose the recording medium containing write power information about the generated recording waveform at a specific zone of a recording layer. In the same field of endeavor, Furukawa discloses an optical disk for recording and reproducing high density signals which further has a control area, in which laser power information and beam modulation pattern information is stored (Figure 2, Element 61 and Column 13, lines 15-22). Yokoi does not disclose wherein the data recorded on the disc further contains additional recording information including power information. In the same field of endeavor, Furukawa discloses an optical disk for recording and reproducing high density signals which further has a control area, in which laser power information and beam modulation pattern information is stored (Figure 2, Element 61 and Column 13, lines 15-22).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to provide the control data area, containing power and modulation information, of Furukawa to the CD-ROM of Yokoi, motivation being to simplify the

recording method of Yokoi wherein power control is read directly from the disc rather than an outside program or device, thereby increasing the access speed.

Claims 26 and 33- 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoi et al (hereafter Yokoi) (US 5,732,062) and in view of Minemura et al (hereafter Minemura) (US 5,608,710).

Regarding claim 26, Yokoi does not disclose wherein power levels of the multi-pulse train constituting the erasure pattern periodically change between at least two levels, a high erasure power level Ppe and a low erase power level Pbe. In the same field of endeavor, Minemura discloses a multi-pulse train which includes to erasure power levels, EH and EL.

One of ordinary skill in the art at the time of the applicant's invention would found it obvious to provide the modulation apparatus of Yokoi with the dual power levels of Minemura, motivation being to effectively reduce jitter in the system (Column 3, lines 35-50 of Minemura). In addition, providing two erasure power levels account for the erasure differences between the marks and spaces, which could lead to degradation in the amount of rewrites on the optical disc.

Regarding claim 33, Minemura discloses wherein the recording waveform further comprises an erasure pattern formed of an erase multi-pulse train for data erasure (Figure 3), and the erasure multi-pulse train has a high erase power level (Figure 7, element EH) and a low erase power level (Figure 7, element EL) and a low erase power level is set equal to a predetermined DC level of a general erase power (Figure 4, level

EH=EL and Column 4, line 12), a high erase power level is set to be equal to the predetermined DC level (Figure 4, level EH=EL and Column 4, line 12) or the predetermined DC level is set between the high erase power level and the low erase power level (Figure 3. Specifically a power level between EH and EL).

Regarding claim 34, Yokoi discloses wherein a ratio of a time duration of the last pulse to a time duration of the multi-pulse train has a predetermined range with respect to a range of jitter allowable by a system (Column 8, lines 41-52, wherein the heating pulse corresponds the multi-pulse heating pulse of Figure 7).

Regarding claim 35, Yokoi discloses wherein a minimum cooling time duration of the last pulse depends on the range of jitter allowable by a system, and a maximum cooling time duration of the last pulse depends on a length of a minimum recorded mark (Column 7, lines 23-35. Specifically, the jitter is reduced with shorter cooling times, which is set to the shortest-length record mark size, to do so).

Regarding claim 36, Yokoi discloses wherein the cooling time duration of the last pulse of the recording pattern is set to the length of the minimum recorded mark (Column 8, lines 17-22).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS D. ALUNKAL whose telephone number is (571)270-1127. The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571)272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thang V. Tran/
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